

26 JAN 2005

## PATENT COOPERATION TREATY

SAAPUNUT

From the  
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

11 31 05. 2004

To:

PCT

Oy JALO ANT-WUORINEN AB

Oy Jalo Ant-Wuorinen Ab  
Iso Roobertinkatu 4-6 A  
FI-00120 HELSINKI  
FinlandWRITTEN OPINION OF THE  
INTERNATIONAL PRELIMINARY  
EXAMINING AUTHORITY

(PCT Rule 66)

PW + Taul  
9. 7. 04Date of mailing  
(day/month/year)

11-05-2004

Applicant's or agent's file reference

40156 TL

REPLY DUE

within 60 days from  
the above date of mailing

International application No.

PCT/FI 2003/000630

International filing date (day/month/year)

28.08.2003

Priority date (day/month/year)

28.08.2002

International Patent Classification (IPC) or both national classification and IPC

B01D 1/06

Applicant

STERIS EUROPE INC. SUOMEN SIVULIIKE et al

1. ☐ The written opinion established by the International Searching Authority:  
☐ is ☐ is not  
considered to be a written opinion of the International Preliminary Examining Authority.
2. This first (first, etc.) opinion contains indications relating to the following items:
- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability, citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☒ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application
3. The applicant is hereby invited to reply to this opinion.
- When?** See the time limit indicated above. The applicant may, before the expiration of that time limit, request this Authority to grant an extension, see Rule 66.2(e).
- How?** By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3. For the form and the language of the amendments, see Rules 66.8 and 66.9.
- Also** For the examiner's obligation to consider amendments and/or arguments, see Rule 66.4bis. For an informal communication with the examiner, see Rule 66.6. For an additional opportunity to submit amendments, see Rule 66.4.
- If no reply is filed, the international preliminary examination report will be established on the basis of this opinion.
4. The final date by which the international preliminary report on patentability (Chapter II of the PCT) must be established according to Rule 69.2 is: 28.12.2004

Name and mailing address of the IPEA/SE

Patent- och registreringsverket  
Box 5055

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Facsimile No. 46 8 667 72 88

Form PCT/IPEA/408 (cover sheet) (January 2004)

Authorized officer

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**WRITTEN OPINION OF THE  
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY**

International application No.

PCT/FI 2003/000630

**Box No. I      Basis of the opinion**

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This opinion is based on a translation from the original language into the following language \_\_\_\_\_, which is the language of a translation furnished for the purposes of:

- ☐ international search (under Rules 12.3 and 23.1(b))  
☐ publication of the international application (under Rule 12.4)  
☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the elements of the international application, this opinion has been established on the basis of *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed.")*:

☒ the international application as originally filed/furnished

☐ the description: \_\_\_\_\_ as originally filed/furnished  
 pages \_\_\_\_\_  
 pages \_\_\_\_\_ received by this Authority on \_\_\_\_\_  
 pages \_\_\_\_\_ received by this Authority on \_\_\_\_\_

☐ the claims: \_\_\_\_\_ as originally filed/furnished  
 pages \_\_\_\_\_ as amended (together with any statement) under Article 19  
 pages \_\_\_\_\_ received by this Authority on \_\_\_\_\_  
 pages \_\_\_\_\_ received by this Authority on \_\_\_\_\_

☐ the drawings: \_\_\_\_\_ as originally filed/furnished  
 pages \_\_\_\_\_  
 pages \_\_\_\_\_ received by this Authority on \_\_\_\_\_  
 pages \_\_\_\_\_ received by this Authority on \_\_\_\_\_

☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages \_\_\_\_\_  
☐ the claims, Nos. \_\_\_\_\_  
☐ the drawings, sheets/figs \_\_\_\_\_  
☐ the sequence listing (*specify*): \_\_\_\_\_  
☐ any table(s) related to the sequence listing (*specify*): \_\_\_\_\_

4. ☐ This opinion has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages \_\_\_\_\_  
☐ the claims, Nos. \_\_\_\_\_  
☐ the drawings, sheets/figs \_\_\_\_\_  
☐ the sequence listing (*specify*): \_\_\_\_\_  
☐ any table(s) related to the sequence listing (*specify*): \_\_\_\_\_

**WRITTEN OPINION OF THE  
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY**

International application No.

PCT/FI 2003/000630

**Box No. V** Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

## 1. Statement

Novelty (N)	Claims	<u>1-10</u>	<u>Y</u>
	Claims	_____	
Inventive step (IS)	Claims	<u>1, 3-4, 6, 8</u>	<u>N</u>
	Claims	<u>2, 5, 7, 9, 10</u>	
Industrial applicability (IA)	Claims	<u>1-10</u>	<u>Y</u>
	Claims	_____	

## 2. Citations and explanations:

**The invention**

The present invention concerns production of purified steam using a falling-film evaporator and rising channels for separating water droplets and impurities.

Highly purified steam is required for various medical purposes, such as production of pharmaceuticals, demanding sterilization applications and production of water for injection.

This requirement is met by producing steam and liquid in the falling-film evaporator. The liquid is collected below the lower end of the evaporator. A flow of steam is conducted upward in a spiralling rotational path. Droplets are separated from the upward flow. The separated droplets form a reject stream, which is removed from the process. A part of the collected liquid is returned to the feed stream to form a circulating liquid.

**Cited document**

This document is cited in the International Search Report. The citation is considered to describe the most relevant prior art:

D1) US-A1-3 875 017

A multi-stage thin film evaporator having a helical vapour flow path is already known from D1. Water which was not

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WRITTEN OPINION OF THE  
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

International application No.

PCT/FI 2003/000630

## Supplemental Box

In case the space in any of the preceding boxes is not sufficient.  
Continuation of: Box V

evaporated in a distillation stage (10) continues by a pipe (23) to an evaporator of a distillation stage (11) (fig. 1 & column 2, lines 31-37). The vapour liberated in the distillation stage rises upwardly in an annular space between a tube (77) and a jacket tube (79) and is forced to travel upwardly through a helical flow duct (80). In this duct the vapour has a high velocity, as a result of which the radial acceleration flings any water droplets which may have been entrained with the vapour through small apertures (81) into an annular space (82), whence they run back down. The pure vapour continues its upward flow and departs through the pipe (83) to the next distillation stage (fig. 4 & column 4, lines 53-65).

The invention is particularly appropriate for the distilling of sea water to become household or other service water or for producing distilled water e.g. for pharmaceutical purposes (column 1, lines 7-11).

## Analysis

## Claim 1

The content of claim 1 differs from that of D1 in that the collected liquid is returned to the feed stream to form a circulating liquid. By this recirculation, the water is assumed to be more purified than before. However, D1 reveals that that water which is not evaporated continues to a successive evaporation step. In both cases, the collected, un-evaporated water is evaporated once again and the water is further purified. One evaporator according to the present invention instead of a multi-stage evaporator according to D1, results in a smaller apparatus.

A person skilled in the art who is aware of D1 encounters the problem of designing one evaporator instead of the multi-stage evaporator according to D1, in order to reduce the size of the evaporator. This modification is considered obvious and claim 1 fails to describe an inventive step. Furthermore, recirculation of liquid that has not evaporated is a well known procedure in the field of evaporation c.f. US-A1-4 166 773 (fig. 1 & column 3, lines 31-33) and US-A1-0 610 505 (fig. 5 & p 24, lines 27-42). The purpose of the

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WRITTEN OPINION OF THE  
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

International application No.

PCT/FI 2003/000630

## Supplemental Box

In case the space in any of the preceding boxes is not sufficient.  
Continuation of: BOX V

recirculation is to save energy and increase the yield of purified products.

*Claim 3*

Claim 3 discloses a temperature controlled surface. This technology is taught in WO-A1-0224299 (fig 2 & p 3, line 11-p 4, line 7). A person skilled in the art who knows D1 can adjust the evaporator with the technique described in WO-A1-0224299 and arrive at the surface according to claim 3.

*Claim 4*

Removing dissolved gases according to claim 4 is considered to lack an inventive step.

*Claim 6*

Independent claim 6 describes an apparatus for carrying out the method according to claim 1. D1 anticipates the method of claim 1 and D1 also reveals an apparatus that is relevant to the technique of claim 6. The arguments against claim 1 above, with respect to its lack of inventive step, are also relevant for claim 6.

*Claim 8*

Claim 8 discloses features which are similar to those of claim 3.

**Conclusion**

In accordance with the arguments stated above, the invention in claims 1-10 is novel. The invention according to claims 1, 3-4, 6, and 8 is novel, but not considered to involve an inventive step. All the claims are considered to have industrial applicability.

WRITTEN OPINION OF THE  
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

International application No.

PCT/FI 2003/000630

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

Claims shall contain: a characterising portion - preceded by the words "characterised in that," "characterised by," or any other words to the same effect (Rule 6.3 (b)).

Where the international application contains drawings, the technical features mentioned in the claims shall preferably be followed by the reference signs relating to such features. See Rule 6.2 (b).

Oy JALO ANT-WUORINEN Ab

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24 June 2004

Our Reference: 40156/TLA

**International Patent Application No. PCT/FI2003/000630 - Steris Europe Inc.**

This is a response to the written opinion dated 11.5.2004.

According to the Opinion, claims 1, 3-4, 6 and 8 lack an inventive step in view of D1, US 3,875,017. Claims 2, 5, 7, 9 and 10 are not commented on. We presume, that this indicates the presence of an inventive step in these claims.

However, D1 describes aspects of an earlier design of the applicant company. According to the description in column 4, lines 50-52, the water from the bottom departing through pipe 85 is conducted to the next distillation stage. This also applies to the water stemming from the droplets separated by radial acceleration in the helical duct, as these "run back down" according to col. 4, lines 62-36, also obvious from the figures. This means, that the impurity-containing fraction from the droplet separator is not removed from the process, as specified in present claim 1, but is carried over to a subsequent distillation stage.

The device of D1 is a multi-effect distillation plant for producing water. The droplet fractions from the separator in each stage is returned to the bottom water phase of that stage, which then enters the next stage to be partially evaporated. Thus, the impurity fraction is not separated from the system immediately upon separation from the steam, as in the present invention. Nothing in D1 points towards such a separation principle.

The object of the present invention is a single-effect device for producing pure steam, i.e. water vapour. US 4,166,773 is concerned with a process for separating heat sensitive components using a device comprising a falling film evaporator and a tray column. EP 610 505 is concerned with regenerating spent detergent by vacuum distillation. Though recycling is disclosed, as in countless other distillation processes, these publications are in no way related to the production of high quality steam.

In our view, the present claims define an invention possessing both novelty and inventive step. We respectfully request reconsideration of the arguments put forward in the written opinion.

Yours faithfully,

OY JALO ANT-WUORINEN AB

Tord Langenskiöld